

## ABSTRACT OF THE DISCLOSURE

The invention relates to methods and compositions for producing transgenic animals by targeted homologous recombination comprising targeting an exogenous polynucleotide or exogenous complementary polynucleotide pair to a predetermined endogenous DNA target sequence in a target cell by homologous pairing, particularly for altering an endogenous DNA sequence, such as a chromosomal DNA sequence. In certain embodiments, the invention relates to compositions that contain exogenous targeting polynucleotides, complementary pairs of exogenous targeting polynucleotides, chemical substituents of such polynucleotides, and recombinase proteins used in the methods of the invention.